AEROSPACE MATERIAL SPECIFICATION

AMS3676	REV. D

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Superseding AMS3676C

Insulation, Sound and Thermal Resin-Bonded Glass Fiber, Medium Filament

RATIONALE

This document has been determined to contain basic and stable technology which is not dynamic in nature.

STABILIZED NOTICE

This document has been declared "Stabilized" by the SAE AMS P Polymeric Materials Committee and will no longer be subjected to periodic reviews for currency. Users are responsible for verifying references and continued suitability of technical requirements. Newer technology may exist.

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1. SCOPE:

1.1 Form: This specification covers resin-bonded glass fibers in the form of felted pads, flat or in rolls.

1.2 Application: Primarily to provide acoustical insulation of aircraft cabins and thermal insulation up to 260°C (500°F).

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM C167 - Thickness and Density of Blanket or Batt Thermal Insulations
ASTM C177 - Steady-State Thermal Transmission Properties by Means of the Guarded Hot Plate

2.3 U.S. Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19103.

2.3.1 Military Standards:

MIL-STD-794 - Parts and Equipment, Procedures for Packaging and Packing of

3. TECHNICAL REQUIREMENTS:

3.1 Material and Fabrication: The product shall be composed of medium filament glass fibers matted into sheets and bonded with a thermosetting resin.

3.2 Properties: The product shall conform to the following requirements; tests shall be performed on the product supplied and in accordance with specified test methods, insofar as practicable.

3.2.1	Density:	0.50 lb per cu ft ± 0.09 (8.0 kg/m^3 ± 1.5)	ASTM C167
3.2.2	Thermal Conductivity, max:	0.26 Btu/hr per sq ft per °F (1.5 W/m^3 per °C)	ASTM C177
3.2.3	Moisture Absorption, max:	1%	4.5.1
3.2.4	Vibration Resistance:		4.5.2
	Weight loss, max	0.5%	
	Packing	None	
	Disintegration	None	
3.2.5 ø	Flame Resistance:	Pass	4.5.3

3.2.6 Average Filament Diameter: Shall be 0.00009 in. ± 0.00004 (0 002 mm ± 0.0010), determined by a method agreed upon by purchaser and vendor.

3.2.7 ø Corrosiveness: The product shall not have a corrosive or other deleterious effect on other materials when exposed to conditions normally encountered in service. Method of test and acceptance standards shall be as agreed upon by purchaser and vendor. Discoloration of metal shall not be considered objectionable.

3.2.8 Acoustical Properties: When specified, the product shall have acoustical properties acceptable to purchaser, determined by a procedure agreed upon by purchaser and vendor.

3.3 Quality: The product, as received by purchaser, shall be uniform in quality and condition, clean, and free from foreign materials and from imperfections detrimental to usage of the product.

3.4 Sizes and Tolerances: Shall be as follows:

3.4.1 Length:

3.4.1.1 Pads: Not less than 12 ft (3.5 m).

3.4.1.2 Rolls: Not less than 50 ft (15 m).

3.4.2 Width: 54 in. ± 0.5 (1370 mm, ± 12.51, - 0.

3.4.3 Thickness:

Nominal Thickness		Tolerance plus and minus	
Inches	Millimetres	Inches	Millmetres
0.500	12.50	0.062	1.55
1 .000	25.00	0.125	3.10
1.500	37.50	0.188	4.70
2.000	50.00	0.250	6.25

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of the product shall supply all samples for vendor's tests and shall be responsible for performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.6. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to requirements for density (3.2.1), average filament diameter (3.2.6), quality (3.3), and sizes and tolerances (3.4) are classified as acceptance tests and shall be performed on each lot.

4.2.2 Preproduction Tests: Tests to determine conformance to all technical requirements of this specification are classified as preproduction tests and shall be performed prior to or on the initial shipment of the product to a purchaser, when a change in material, processing, or both requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.2.2.1 For direct U.S. Military procurement, substantiating test data and, when requested, preproduction test material shall be submitted to the cognizant agency as directed by the procuring activity, the contracting officer, or the request for procurement.

4.3 Sampling: Shall be as follows:

4.3.1 For Acceptance Tests: Sufficient product shall be taken at random from each lot to perform all required tests. The number of determinations for each requirement shall be as specified in the applicable test procedure or, if not specified therein, not less than three. A lot shall be all product produced in a single production run from the same batch of raw materials under the same fixed conditions and presented for vendor's inspection at one time.

4.3.2 For Preproduction Tests: As agreed upon by purchaser and vendor.

4.4 Approval:

4.4.1 Sample product shall be approved by purchaser before product for production use is supplied, unless such approval be waived by purchaser. Results of tests on production material shall be essentially equivalent to those on the approved sample.

4.4.2 ø Vendor shall use ingredients, manufacturing procedures, processes, and methods of inspection on production material which are essentially the same as those used on the approved sample. If necessary to make any change in ingredients, in type of equipment for processing, or in manufacturing procedures, vendor shall submit for reapproval a statement of the proposed changes in material, processing, or both, and, when requested, sample material. Production material made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.5 Test Methods:

4.5.1 Moisture Absorption: A 6 x 6 in. (150 x 150 mm) specimen, conditioned at 120°C ± 3 (260°F ± 5) for 2 hr ± 0.2, shall be placed in a suitable weighing bottle and the total weight determined. This weight less the weight of the bottle shall be W_1. The specimen shall be removed from the bottle, brought to 50°C ± 1 (120°F ± 2) and subjected to a relative humidity of 95% ± 3 at 50°C ± 1(120°F ± 2) for 96 hr ± 1. The specimen shall be replaced in the weighing bottle and the total-weight recorded. This weight less the weight of the bottle shall be W_2. The percentage of moisture absorption shall be calculated by the following equation:

$$\% \text{ increase} = \frac{W_2 - W_1 \times 100}{W_1}$$

4.5.2 Vibration Resistance: A specimen, nominally 20 in. (500 mm) long and 12 in. (300 mm) wide, shall be mounted with the long sides vertically clamped in such a fashion that the top and bottom shall be open and the entire panel free to vibrate horizontally. The specimen shall be cut so that any stitching which does not cross upon itself shall be vertical. In cases where cross stitching is used, the specimen shall be cut so that the longest dimension of the stitch pattern is vertical. The specimen shall be vibrated horizontally for 12 hr ± 0.5 through a double amplitude of not less than 0.040 in. (1 mm) at a frequency of 1750 cycles per min. ± 50. The specimen shall be weighed before the test is begun and again after completion of the vibration test. Any loss of weight shall be reported.

4.5.3 Flame Resistance: A specimen, nominally 8 in. (200 mm) square, shall be placed in a frame and supported at an angle of 45 deg ± 5 from horizontal. A Bunsen or Tirrill burner shall rest on a horizontal surface; the burner shall be adjusted for no air intake, giving a yellow-tipped 1-1/2 in. (38 mm) flame. Suitable precautions shall be taken to avoid drafts. The flame shall be applied to the specimen at its approximate center for 30 sec ± 1 with one-third of the flame in contact with the specimen, Upon removal of the flame source from the specimen, any flaming of the specimen shall extinguish itself within 15 sec and no smoldering or glowing shall be visible 10 sec thereafter. No complete penetration of the insulation shall result.

4.6 Reports:

4.6.1 The vendor of the product shall furnish with each shipment a report showing the results of tests to determine conformance to the acceptance test requirements and stating that the product conforms to the other technical requirements of this specification. This report shall include the purchase order number, lot number, AMS 3676D, vendor's material designation, and quantity.

4.6.2 The vendor of finished or semi-finished parts shall furnish with each shipment a report showing the purchase order number, AMS 3676D, contractor or other direct supplier of material, supplier's material designation, part number, and quantity. When material for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of material to determine conformance to the requirements of this specification and shall include in the report either a statement that the material conforms or copies of laboratory reports showing the results of tests to determine conformance.

4.7 Resampling and Retesting: If any specimen used in the above tests fails to meet the specified requirements, disposition of the product may be based on the results of testing three additional specimens for each original nonconforming specimen. Failure of any retest specimen to meet the specified requirements shall be cause for rejection of the product represented and no additional testing shall be permitted. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

5.1 Identification: Each roll, pad, or package shall be marked with a durable label or suitable tag showing not less than the following information and attached so that the tag will be visible until the entire roll is used.

INSULATION, SOUND AND THERMAL
RESIN-BONDED GLASS FIBER, MEDIUM FILAMENT
AMS 3676D
WIDTH _____
PURCHASE ORDER NUMBER _____
MANUFACTURER'S IDENTIFICATION _____
LOT NUMBER _____